Alaska

Amchitka Island

Long-Term Stewardship Site Highlights

Amchitka Island

Major Activities - soil and groundwater monitoring; enforcing access restrictions for subsurface contamination
Site Size - 30,000 hectares (74,000 acres)
Start/End Years - 2004/in perpetuity
Estimated Average Annual Cost FY 2004-2006 - $23,000

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AMCHITKA ISLAND

1.0 SITE SUMMARY

1.1 Site Description and Mission

Amchitka Island is in the western Aleutian Islands chain and is about 2,156 kilometers (1,340 miles) southwest of Anchorage, Alaska. The site was first used by the U.S. Government in 1943, when American troops landed on the island to establish an airfield to prevent the enemy forces from gaining strategic control of the islands during World War II. Anti-personnel devices such as steel spikes still remain scattered across the island and continue to pose a hazard for onsite workers.

LONG-TERM STEWARDSHIP HIGHLIGHTS

Major Long-Term Stewardship Activities - soil and groundwater monitoring; enforcing access restrictions for subsurface contamination
Total Site Area - 30,000 hectares (74,000 acres)
Estimated Volume of Residual Contaminants - unknown
Long-Term Stewardship Start-End Years - 2004-in perpetuity
Average Annual Long-Term Stewardship Cost FY 2004-2006 - $23,000
Landlord - U.S. Department of Interior

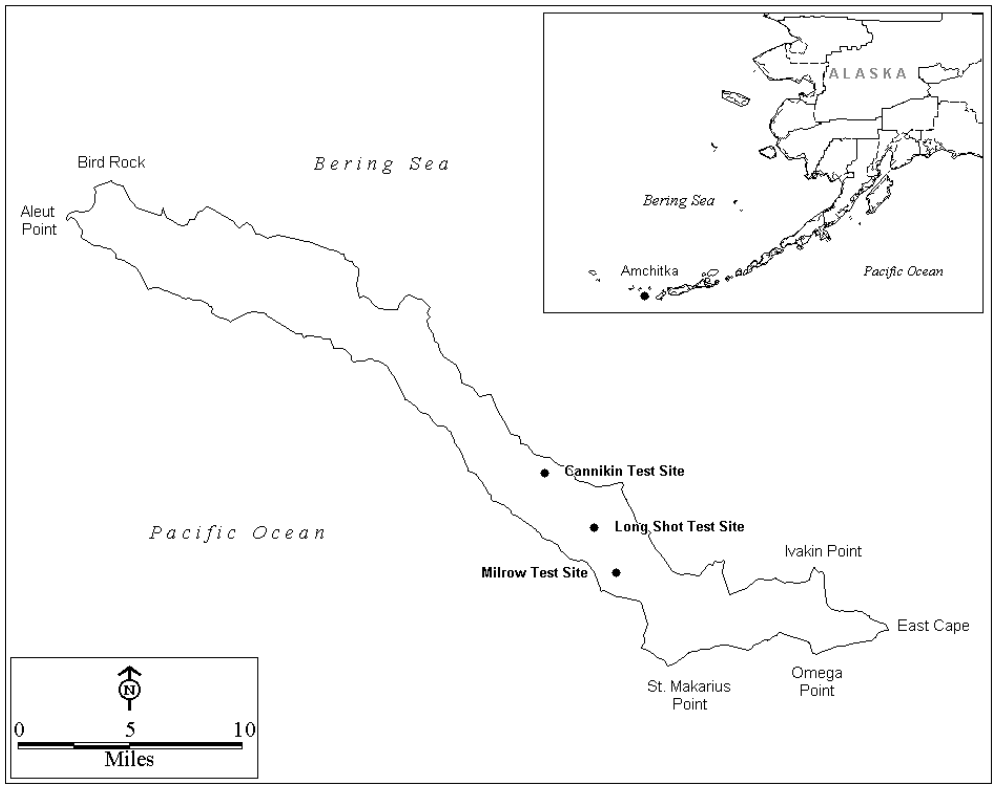
The U.S. Atomic Energy Commission (later known as the U.S. Department of Energy) conducted three sub-surface nuclear detonations on Amchitka Island in October 1965, October 1969, and November 1971. The first of the three underground tests, known as Long Shot, was a nuclear detection research experiment detonated at a depth of 700 meters (2,300 feet), with a yield of about 80 kilotons. The second detonation, referred to as Milrow, was a high-yield seismic calibration test detonated at a depth of 1,220 meters (4,000 feet), with a yield of about one megaton. The third and final detonation, known as Cannikin, was a test of a proposed warhead. Cannikin was detonated at a depth of about 1,790 meters (5,875 feet), with a yield of almost five megatons. In addition to the three test locations, DOE is responsible for three other areas where emplacement holes were drilled but never used for testing.

DOE's mission at Amchitka Island is to complete remediation of surface contamination and continue the long-term stewardship of residual subsurface contamination. Amchitka Island is currently part of the Alaska Maritime National Wildlife Refuge and is managed by the U.S. Fish and Wildlife Service (USFWS). The USFWS will continue to manage the site for the foreseeable future. DOE's expected end-state for Amchitka Island will allow for future surface use at the site, with restrictions placed on intrusion into any capped soil areas. DOE will restrict access to the test cavities, subsurface, and groundwater indefinitely.

1.2 Site Cleanup and Accomplishments

Drilling of the emplacement holes and post-test sampling resulted in surface contamination that consists of approximately 30 contaminated areas, including six emplacement holes, one adjacent drill back hole, multiple monitoring wells, multiple mud pits, landfills, and shaker pad areas. The potential constituents of concern for surface soils and surface waters are total petroleum hydrocarbons from diesel fuel, volatile organic compounds, lead, chromium, and tritium. A corrective action plan for the surface contamination is currently being developed and corrective actions are scheduled to begin in 2001. A joint DOE, USFWS, and State of Alaska examination of the area is currently scheduled for June 2000.

Based on site characterization, the DOE, USFWS, and State will make a decision for each area of contamination, whether corrective action is warranted or if no surface remediation is necessary. Based on these decisions, each area of surface contamination on the Island will either be "clean closed" or closed in place, although most are expected to be closed in place. Closure in place will entail leaving the drilling muds in their present location, draining water collected in basins above the mud pits, placing an engineered cover over the drilling muds, and



Amchitka Island

increasing the strength of the pit walls, where necessary. DOE anticipates that all negotiations with the State, and any resulting surface corrective actions, will be completed by 2004.

Subsurface contamination associated with the underground detonation of nuclear tests consists of radionuclides in the test cavities. Subsurface contamination will not be remediated due to the lack of feasible technologies for removing the site's subsurface contamination. The primary concerns of the State of Alaska will be to ensure that the existing subsurface contamination associated with the underground nuclear detonation does not impact the marine environment or result in health risks to subsistence fishermen in the area. Remaining subsurface activities at the site include continued characterization of groundwater flow, assessing risk, and developing the site closure report. DOE anticipates that subsurface closure activities will be completed by 2004.

2.0 SITE-WIDE LONG-TERM STEWARDSHIP

2.1 Long-Term Stewardship Activities

DOE will be responsible for monitoring and maintaining institutional controls over the subsurface. By 2004, DOE's role at the site will be limited to conducting long-term stewardship activities. Final long-term stewardship requirements for the site will be negotiated with the USFWS, the State of Alaska, and Tribal Nations once a risk assessment is completed. There will be two closure reports for the site, one for the surface and another for the subsurface. The surface closure report will describe surface contaminants and corrective action activities. The subsurface closure report will focus on the subsurface and marine environments. Final long-term stewardship requirements will be detailed in each of these closure reports.

DOE maintains the project-specific records at the Nevada Operations Office in Las Vegas, Nevada. These records include a compilation of work plans, data reports, numerical models, numerical model results, monitoring results, health assessments, risk assessments, Letters of Accomplishment, Closure Reports, comments and information submitted by the public, relevant State agreements, and other writings pursuant to the negotiated corrective action process. Records are retained according to DOE records retention procedures. Upon the completion of the project, all project files will be transferred to controlled storage at the Nevada Operations Office in Las Vegas, Nevada, and other entities, as required by agreements with the State of Alaska.

STAKEHOLDER INVOLVEMENT

Public participation for the Amchitka Island environmental restoration project is being implemented in accordance with the State of Alaska regulations and agreements reached with the USFWS and the Aleutian/Pribilof Islands Association (which represents the native population). At the initiation of project work, DOE identified the relevant state regulators, federal agencies, tribal governments, interest groups, and stakeholders expected to have an interest in the project and the site. Issues of interest and concern and key decision points were identified with stakeholders to determine the means by which public involvement will occur. DOE conducts frequent project status meetings/conference calls; informational and technical briefings in accordance with the project schedule; public meetings at designated key decision points in the schedule; and additional technical meetings on an as-needed basis. Other opportunities for involvement might include public hearings, town hall meetings, public workshops, informational and technical briefings, and document reviews.

2.2 Specific Long-Term Stewardship Activities

Soil

If contaminated surface areas are closed in place with engineered caps, institutional controls to restrict access to the residual contamination may be required. The specific long-term stewardship activities for the surface areas will be detailed in the site closure report, but will include visual inspections, cap maintenance, information management, and environmental monitoring activities.

Groundwater

A monument has been placed at the site to mark the locations of the test. DOE will maintain institutional controls over the subsurface to prevent access to the test cavities, groundwater, and associated subsurface contamination in perpetuity. The institutional controls will include a restriction on well drilling on the site. DOE will work with the USFWS to ensure that all restrictions are incorporated into the USFWS management plan for the island. Due to the geographic isolation of the site and the cost associated with visiting the site, DOE assumes that long-term stewardship and monitoring activities will be conducted every five years. Monitoring wells are estimated to require repair or replacement every 25 years. At the end of the post-closure groundwater monitoring period in 2104, the monitoring wells will be plugged and abandoned in place in accordance with state regulations.

2.3 Regulatory Regime

In accordance with applicable regulatory drivers listed below, DOE is responsible for identifying the nature and extent of contamination, determining potential risk to the public and the environment, and performing the necessary corrective actions in compliance with guidelines and requirements under federal regulatory drivers, as well as the state-specific regulatory drivers associated with the site location.

Resource Conservation and Recovery Act (RCRA): RCRA was the first comprehensive federal effort to deal with solid and hazardous waste and regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. At Amchitka Island, RCRA is enforced to protect human health and the environment; conserve energy and natural resources; reduce the amount of generated waste; and ensure that wastes are managed in an environmentally sound manner.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): CERCLA supplies a system for identifying and providing corrective action to sites where hazardous substances have been released into any part of the air, water, groundwater, or land. Provisions of CERCLA include a National Contingency Plan, which establishes procedures for corrective action for hazardous substance releases. Amchitka Island is not regulated under CERCLA; however, the regulations are useful as developmental guidelines.

In addition to federal regulations, DOE must comply with state regulatory requirements in Alaska. In most cases, State of Alaska requirements are based on federal guidelines; however, in specific cases they may be more detailed and stringent than federal regulations.

Nuclear Regulatory Commission (NRC): NRC regulations establish "free release" criteria. Amchitka Island is not regulated under the NRC; however, the regulations are useful as developmental guidelines.

2.4 Assumptions and Uncertainties

A correction action plan is currently being developed and remediation is scheduled to begin at the site in 2001. While much of the surface contamination has been characterized, the extent of groundwater and associated subsurface contamination is continuing to be characterized. Subsurface closure is not scheduled until 2004.

Long-term stewardship activities have not yet been finalized with the State and regulators. Therefore, long-term stewardship activities and associated costs may change, depending on final agreements. DOE assumes that Amchitka Island will not be placed on the National Priorities List and that regulators and stakeholders will agree to implement closures in place for the mud pits. In most cases, engineered caps will be placed over the contaminated areas to contain residual contamination. DOE also assumes that groundwater remediation will not be necessary at the site due to technical infeasibility.

3.0 Estimated Site-Wide Long-Term Stewardship Costs

The cost profile in the table below applies to the entire Amchitka Island site. The major long-term stewardship costs are for monitoring activities, data analysis, and repair and replacement of monitoring wells. DOE estimates that monitoring wells would need to be repaired or replaced every 25 years.

Site Long-Term Stewardship Costs (Constant Year 2000 Dollars)					
Year(s)	***Amount***	***Year(s)***	***Amount***	***Year(s)***	***Amount***
FY 2000	$0	**FY 2008**	$0	**FY 2036-2040**	$215,000
FY 2001	$0	**FY 2009**	$70,000	**FY 2041-2045**	$215,000
FY 2002	$0	**FY 2010**	$145,000	**FY 2046-2050**	$215,000
FY 2003	$0	**FY 2011-2015**	$215,000	**FY 2051-2055**	$215,000
FY 2004	$70,000	**FY 2016-2020**	$215,000	**FY 2056-2060**	$215,000
FY 2005	$0	**FY 2021-2025**	$215,000	**FY 2061-2065**	$215,000
FY 2006	$0	**FY 2026-2030**	$215,000	**FY 2066-2070**	$215,000
FY 2007	$0	**FY 2031-2035**	$215,000	**Post FY 2070**	$1,400,000

The long-term stewardship cost estimates for Amchitka Island are approximately $70,000 every fifth year through 2009. These costs include a visual site inspection, soil and groundwater sampling, and monitoring activities conducted every five years. In addition, each five-year cost increment from FY 2011 to FY 2070 includes $145,000 for data and sample analysis in the year following the collection of soil and groundwater samples. DOE projects that the total post-FY 2070 (FY 2071-2104) costs will be approximately $1.4 million dollars.

4.0 FUTURE USES

DOE anticipates that the USFWS will continue to manage the island 30,000 hectares (74,000 acres) as a wildlife refuge. Access to the test cavities, subsurface, and groundwater will continue to be restricted in perpetuity.

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